SAF-RC-232
100-IU-2 & 100-IU-6 Remaining Waste Sites – Soil Full Protocol
FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Kathy Wendt	H4-21	KW 4/22/13 INITIAL/DATE

COMMENTS:

SDG JP0481 SAF-RC-232

Sample Location: 600-303

Date: 15 April 2013
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-IU-2 & 100-IU-6 Remaining Waste Sites – Soil Full Protocol - Waste Site 600-303
Subject: Polyaromatic Hydrocarbon - Data Package No. JP0481-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0481 prepared by TestAmerica Laboratories (TAL). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J1RFN3	2/20/13	Soil	C	See note 1
J1RFN4	2/20/13	Soil	C	See note 1

1 – Polyaromatic hydrocarbons by 8310.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, September 2009). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Data Requested by Client

DATA QUALITY OBJECTIVES

Holding Times

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

- **Method Blanks**

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U".

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

All accuracy results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of

compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the contract required quantitation limit (CRQL) are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All duplicate results were acceptable.

Field Duplicate Samples

One set of field duplicates (J1RFN3/J1RFN4) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

- **Completeness**

Data package No. JP0481 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*, March 2008.

DOE/RL-96-22, Rev. 5, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, September 2009.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the WCH validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the same quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

POLYAROMATIC HYDROCARBON DATA QUALIFICATION SUMMARY*

SDG: JP0481	REVIEWER: ELR	Project: 600-303	PAGE 1 OF 1
COMMENTS: No qualifiers assigned			

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Annotated Laboratory Reports

Client: Washington Closure Hanford

Job Number: 280-39178-1
Sdg Number: JP0481

Client Sample ID: J1RFN3

Lab Sample ID: 280-39178-2
Client Matrix: Solid

% Moisture: 3.9

Date Sampled: 02/20/2013 1107
Date Received: 02/22/2013 1000

8310 PAHs (HPLC)

Analysis Method:	8310	Analysis Batch:	280-161891	Instrument ID:	CHHPLC_G
Prep Method:	3550C	Prep Batch:	280-161725	Initial Weight/Volume:	30.2 g
Dilution:	1.0			Final Weight/Volume:	4000 uL
Analysis Date:	02/25/2013 1822			Injection Volume:	20 uL
Prep Date:	02/22/2013 2025			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		10	U	10	100
Acenaphthylene		9.3	U	9.3	100
Anthracene		3.2	U	3.2	21
Benzo[a]anthracene		3.3	U	3.3	16
Benzo[a]pyrene		6.6	U	6.6	16
Benzo[b]fluoranthene		4.3	U	4.3	16
Benzo[g,h,i]perylene		7.4	U	7.4	31
Benzo[k]fluoranthene		4.1	U	4.1	16
Chrysene		5.0	U	5.0	41
Dibenzo(a,h)anthracene		11	U	11	31
Fluoranthene		13	U	13	41
Fluorene		5.5	U	5.5	31
Indeno[1,2,3-cd]pyrene		12	U	12	31
Naphthalene		12	U	12	100
Phenanthrene		12	U	12	41
Pyrene		12	U	12	41

Surrogate	%Rec	Qualifier	Acceptance Limits
Terphenyl-d14 (SUR)	87		72 - 115

4/14/13

Client: Washington Closure Hanford

Job Number: 280-39178-1
Sdg Number: JP0481

Client Sample ID: J1RFN4
Lab Sample ID: 280-39178-3
Client Matrix: Solid
% Moisture: 3.5

Date Sampled: 02/20/2013 1107
Date Received: 02/22/2013 1000

8310 PAHs (HPLC)

Analysis Method:	8310	Analysis Batch:	280-161891	Instrument ID:	CHHPLC_G
Prep Method:	3550C	Prep Batch:	280-161725	Initial Weight/Volume:	31.5 g
Dilution:	1.0			Final Weight/Volume:	4000 uL
Analysis Date:	02/25/2013 1953			Injection Volume:	20 uL
Prep Date:	02/22/2013 2025			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		9.9	U	9.9	99
Acenaphthylene		8.9	U	8.9	99
Anthracene		3.0	U	3.0	20
Benzo[a]anthracene		3.1	U	3.1	15
Benzo[a]pyrene		6.3	U	6.3	15
Benzo[b]fluoranthene		4.1	U	4.1	15
Benzo[g,h,i]perylene		7.1	U	7.1	30
Benzo[k]fluoranthene		3.9	U	3.9	15
Chrysene		4.8	U	4.8	39
Dibenzo(a,h)anthracene		11	U	11	30
Fluoranthene		13	U	13	39
Fluorene		5.2	U	5.2	30
Indeno[1,2,3-cd]pyrene		12	U	12	30
Naphthalene		12	U	12	99
Phenanthrene		12	U	12	39
Pyrene		12	U	12	39

Surrogate	%Rec	Qualifier	Acceptance Limits
Terphenyl-d14 (SUR)	88		72 - 115

4/14/13

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Report Number: 280-39178-1

SDG #: JP0481
SAF#: RC-232

Date SDG Closed: February 22, 2013
Data Deliverable: 7 Day / Summary

CLIENT ID	LAB ID	ANALYSES REQUESTED	ANALYSES PERFORMED
J1RFN2	280-39178-1	6010/7471	6010B/7471A
J1RFN3	280-39178-2	6010/7471/9056M/353.2/8310	6010B/7471A/9056M/353.2/8310
J1RFN4	280-39178-3	6010/7471/9056M/353.2/8310	6010B/7471A/9056M/353.2/8310

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this Case Narrative. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the signature on the Report Cover.

With exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits, with any exceptions noted. Calculations are performed before rounding to avoid round-off errors in calculated results.

This report includes reporting limits (RLs) less than TestAmerica Denver's practical quantitation limits. These reporting limits are being used specifically at the client's request to meet the needs of this project. Please note that data are not normally reported to these levels without qualification, since they are inherently less reliable and potentially less defensible than required by the current NELAC standards.

The results, RLs and MDLs included in this report have been adjusted for dry weight, as appropriate.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 2/22/2013 10:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.9° C.

HPLC - SW846 8310 - PAHs
No anomalies were encountered.

TOTAL METALS - SW846 6010B/7471A
Serial dilution of a digestate in batch 280-161812 indicates that physical and chemical interferences are present for Aluminum. Results have been flagged with an "X".

Low levels of Cadmium are present in the method blank associated with batch 280-161812. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

Silicon was recovered outside the control limits, biased low, in the LCS associated with batch 280-161812, and the associated sample results have been flagged "N". Silicon is a poor performer and has a history of reacting inconsistently. Data are reported as is.

It can be noted that the sample amount was greater than four times the spike amount for Iron in the Matrix Spike performed on sample J1RFN2; therefore, control limits are not applicable.

Aluminum was recovered outside the control limits in the Matrix Spike performed on sample J1RFN2, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

The duplicate analysis of sample J1RFN2 exhibited RPD data outside the control limits for Lead, Manganese, Vanadium, Zinc and Iron, and the associated sample results have been flagged "M". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

Antimony is present at a level greater than the reporting limit in the instrument blank associated with analysis batch 280-162255. As Antimony is not present at a level greater than the reporting limit in the associated samples, corrective action is deemed unnecessary.

No other anomalies were encountered.

GENERAL CHEMISTRY - MCAWW 353.2 - NITRATE NITRITE as N

The Matrix Spike performed on sample J1RFN4 exhibited the percent recovery outside the control limits, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

The duplicate analysis of sample J1RFN4 exceeded the RPD limit, and the associated sample result has been flagged "M". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

GENERAL CHEMISTRY - SW846 9056M - ANIONS

The Orthophosphate as P Matrix Spike performed on sample J1RFN3 exhibited the percent recovery outside the control limits, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-232-008	Page 1 of 1
Collector Brackett, R	Company Contact Joan Kessner	Telephone No. 509-375-4688	Project Coordinator KESSNER, JH	Price Code ~~8C~~ 8B BH 2/20/13
Project Designation 100-IU-2 & 100-IU-6 Remaining Waste Sites - Soil Full Prot	Sampling Location 600-303		SAF No. RC-232	Data Turnaround 7 ~~15~~ Days BH 2/20/13
Ice Chest No. WCH-12-0176 BH 2-21-13	Field Logbook No. EL-1666	COA 0603032000	Method of Shipment Fed EX	
Shipped To TestAmerica Incorporated, ~~Richland~~ DENVER BH 2/20/13	Offsite Property No. A120766		Bill of Lading/Air Bill No. See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

May contain hazardous substances at levels that present risk to humans and/or the environment.

Special Handling and/or Storage

Maintain preservation as indicated in header.

Preservation	Cool 4C	Cool 4C	Cool 4C									
Type of Container	G/P	G/P	aG									
No. of Container(s)	1	1	1									
Volume	125mL	125mL	125mL									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	PAHs - 8310									
Sample No.	Matrix *	Sample Date	Sample Time									
J1RFN2	SOIL	2/20/13	1055	X			BH 2/20/13					
J1RFN3	SOIL	2/20/13	1107	X	X	X						
J1RFN4	SOIL	2/20/13	1107	X	X	X						

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Rob Brackett RBB	2-20-13 1145	BHudson BHudson	2/20/13 1145
BHudson BHudson	2/20/13 1330	Cindy Bingham	2-20-13 1330
Cindy Bingham	2-21-13 1313	Fed Ex	2/22/13 0800

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Close-out List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7471 - (CV) {Mercury}

(2) IC Anions - 9056 Modified {Bromide, Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphorous in phosphate, Sulfate}; NO2/NO3 - 353.2 {Nitrogen in Nitrite and Nitrate}; ~~pH (Soil) - 9045 (pH Measurement)~~ BH 2/22/13

JP0481

REVIEWED BY AJ ~~DATE~~ 2-21-13

Matrix *: S=Soil, SD=Sediment, SO=Solid, SL=Sludge, W=Water, O=Oil, A=Air, DS=Drum Solids, DL=Drum Liquids, T=Tissue, WI=Wipe, L=Liquid, V=Vegetation, X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

Appendix 5

Data Validation Supporting Documentation

GENERAL ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 600-303			DATA PACKAGE: JP0481		
VALIDATOR: ELR		LAB: ~~TA~~ 600-303		DATE: 4/14/13	
			SDG: JP0481		

ANALYSES PERFORMED					
8015	8021	8141	8151	8315	8310
		WTPH-HCID	WTPH-G	WTPH-D	

SAMPLES/MATRIX:

JIRFV3 JIRFV4

Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes No N/A

Comments:

2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)

Initial calibrations acceptable? ..... Yes No N/A

Continuing calibrations acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments:

GENERAL ORGANIC DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) ..... Yes No N/A

Calibration blank results acceptable? (Levels D, E) ..... Yes No N/A

Laboratory blanks analyzed? ..... Yes No N/A

Laboratory blank results acceptable? ..... Yes No N/A

Field/trip blanks analyzed? (Levels C, D, E) ..... Yes No N/A

Field/trip blank results acceptable? (Levels C, D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: no FB

4. ACCURACY (Levels C, D, and E)

Surrogates/system monitoring compounds analyzed? ..... Yes No N/A

Surrogate/system monitoring compound recoveries acceptable? ..... Yes No N/A

Surrogates traceable? (Levels D, E) ..... Yes No N/A

Surrogates expired? (Levels D, E) ..... Yes No N/A

MS/MSD samples analyzed? ..... Yes No N/A

MS/MSD results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

LCS/BSS samples analyzed? ..... Yes No N/A

LCS/BSS results acceptable? ..... Yes No N/A

Standards traceable? (Levels D, E) ..... Yes No N/A

Standards expired? (Levels D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Performance audit sample(s) analyzed? ..... Yes No N/A

Performance audit sample results acceptable? ..... Yes No N/A

Comments: no PAS

GENERAL ORGANIC DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? ..... (Yes) No N/A
Duplicate results acceptable? ..... (Yes) No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No (N/A)
MS/MSD standards expired? (Levels D, E) ..... Yes No (N/A)
Field duplicate RPD values acceptable? ..... (Yes) No N/A
Field split RPD values acceptable? ..... Yes (No) N/A
Transcription/calculation errors? (Levels D, E) ..... Yes (No) N/A

Comments: _____

6. HOLDING TIMES (all levels)

Samples properly preserved? ..... (Yes) No N/A
Sample holding times acceptable? ..... (Yes) No N/A

Comments: _____

GENERAL ORGANIC DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? ..... Yes No N/A
Results supported in the raw data? (Levels D, E) ..... Yes No N/A
Samples properly prepared? (Levels D, E) ..... Yes No N/A
Detection limits meet RDL? ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: _____

9. SAMPLE CLEANUP (Levels D and E)

Fluoricil ® (or other aborbant) cleanup performed? ..... Yes No N/A
Lot check performed? ..... Yes No N/A
Check recoveries aceptable? ..... Yes No N/A
Check materials traceable? ..... Yes No N/A
Check materials Expired? ..... Yes No N/A
Analytical batch QC given similar cleanup? ..... Yes No N/A
Transcription/Calculation Errors? ..... Yes No N/A

Comments: _____

Appendix 6

Additional Documentation Requested by Client

Client: Washington Closure Hanford

Job Number: 280-39178-1
Sdg Number: JP0481

Method Blank - Batch: 280-161725

Method: 8310
Preparation: 3550C

Lab Sample ID:	MB 280-161725/1-A	Analysis Batch:	280-161891	Instrument ID:	CHHPLC_G
Client Matrix:	Solid	Prep Batch:	280-161725	Lab File ID:	G0225014.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	31.1 g
Analysis Date:	02/25/2013 1720	Units:	ug/Kg	Final Weight/Volume:	4000 uL
Prep Date:	02/22/2013 2025			Injection Volume:	20 uL
Leach Date:	N/A			Column ID:	PRIMARY

Analyte	Result	Qual	MDL	RL
Acenaphthene	9.6	U	9.6	96
Acenaphthylene	8.7	U	8.7	96
Anthracene	2.9	U	2.9	19
Benzo[a]anthracene	3.1	U	3.1	14
Benzo[a]pyrene	6.2	U	6.2	14
Benzo[b]fluoranthene	4.1	U	4.1	14
Benzo[g,h,i]perylene	6.9	U	6.9	29
Benzo[k]fluoranthene	3.8	U	3.8	14
Chrysene	4.7	U	4.7	39
Dibenzo(a,h)anthracene	11	U	11	29
Fluoranthene	13	U	13	39
Fluorene	5.1	U	5.1	29
Indeno[1,2,3-cd]pyrene	12	U	12	29
Naphthalene	12	U	12	96
Phenanthrene	12	U	12	39
Pyrene	12	U	12	39

Surrogate	% Rec	Acceptance Limits
Terphenyl-d14 (SUR)	88	72 - 115

Client: Washington Closure Hanford

Job Number: 280-39178-1
Sdg Number: JP0481

Lab Control Sample - Batch: 280-161725

Method: 8310
Preparation: 3550C

Lab Sample ID:	LCS 280-161725/2-A	Analysis Batch:	280-161891	Instrument ID:	CHHPLC_G
Client Matrix:	Solid	Prep Batch:	280-161725	Lab File ID:	G0225015.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	30.8 g
Analysis Date:	02/25/2013 1751	Units:	ug/Kg	Final Weight/Volume:	4000 uL
Prep Date:	02/22/2013 2025			Injection Volume:	20 uL
Leach Date:	N/A			Column ID:	PRIMARY

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Acenaphthene	1950	1750	90	78 - 116	
Acenaphthylene	1950	1690	87	76 - 115	
Anthracene	1950	1710	88	74 - 115	
Benzo[a]anthracene	1950	1770	91	85 - 120	
Benzo[a]pyrene	1950	1710	88	74 - 121	
Benzo[b]fluoranthene	1950	1810	93	85 - 115	
Benzo[g,h,i]perylene	1950	1840	94	85 - 120	
Benzo[k]fluoranthene	1950	1860	95	85 - 115	
Chrysene	1950	1780	91	83 - 115	
Dibenzo(a,h)anthracene	1950	1820	93	83 - 115	
Fluoranthene	1950	1850	95	83 - 115	
Fluorene	1950	1750	90	80 - 115	
Indeno[1,2,3-cd]pyrene	1950	1780	91	85 - 123	
Naphthalene	1950	1830	94	80 - 121	
Phenanthrene	1950	1840	94	80 - 115	
Pyrene	1950	1740	90	75 - 116	

Surrogate	% Rec	Acceptance Limits
Terphenyl-d14 (SUR)	88	72 - 115

Client: Washington Closure Hanford

Job Number: 280-39178-1
Sdg Number: JP0481

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-161725

Method: 8310
Preparation: 3550C

MS Lab Sample ID:	280-39178-2	Analysis Batch:	280-161891	Instrument ID:	CHHPLC_G
Client Matrix:	Solid	Prep Batch:	280-161725	Lab File ID:	G0225017.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	31.4 g
Analysis Date:	02/25/2013 1852			Final Weight/Volume:	4000 uL
Prep Date:	02/22/2013 2025			Injection Volume:	20 uL
Leach Date:	N/A			Column ID:	PRIMARY

MSD Lab Sample ID:	280-39178-2	Analysis Batch:	280-161891	Instrument ID:	CHHPLC_G
Client Matrix:	Solid	Prep Batch:	280-161725	Lab File ID:	G0225018.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	30.3 g
Analysis Date:	02/25/2013 1923			Final Weight/Volume:	4000 uL
Prep Date:	02/22/2013 2025			Injection Volume:	20 uL
Leach Date:	N/A			Column ID:	PRIMARY

Analyte	% Rec. MS	% Rec. MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Acenaphthene	86	93	78 - 116	12	20		
Acenaphthylene	84	77	76 - 115	5	21		
Anthracene	87	86	74 - 115	2	20		
Benzo[a]anthracene	89	89	85 - 120	3	20		
Benzo[a]pyrene	87	88	74 - 121	5	20		
Benzo[b]fluoranthene	91	94	85 - 115	7	20		
Benzo[g,h,i]perylene	92	92	85 - 120	4	20		
Benzo[k]fluoranthene	93	93	85 - 115	4	20		
Chrysene	89	89	83 - 115	4	20		
Dibenzo(a,h)anthracene	91	91	83 - 115	4	20		
Fluoranthene	93	94	83 - 115	4	20		
Fluorene	88	84	80 - 115	1	20		
Indeno[1,2,3-cd]pyrene	89	91	85 - 123	6	20		
Naphthalene	92	87	80 - 121	2	20		
Phenanthrene	92	93	80 - 115	5	20		
Pyrene	88	88	75 - 116	4	20		

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
Terphenyl-d14 (SUR)	90	89	72 - 115

Date: 15 April 2013
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-IU-2 & 100-IU-6 Remaining Waste Sites – Soil Full Protocol - Waste Site 600-303
Subject: Wet Chemistry - Data Package No. JP0481-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0481 prepared by TestAmerica Laboratories (TAL). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J1RFN3	2/20/13	Soil	C	See note 1
J1RFN4	2/20/13	Soil	C	See note 1

1 – IC anions by 300.0, nitrate/nitrite by 353.2.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, September 2009). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY PARAMETERS

· Holding Times

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: 28 days for nitrate/nitrite, chloride, fluoride, bromide, sulfate; and 48 hours for nitrate, nitrite and orthophosphate.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

Due to the holding time being exceeded by greater than twice the limit, all undetected nitrate, nitrite and orthophosphate results were qualified as rejected and flagged "UR".

Due to the holding time being exceeded by greater than twice the limit, all detected nitrate, nitrite and orthophosphate results were qualified as estimates and flagged "J".

All other holding times were acceptable.

- **Method Blanks**

Method Blanks

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. All blank results must fall below the contract required detection limit (CRQL) to be acceptable.

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate

analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J1RFN3/J1RFN4) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQLs) to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

- **Completeness**

Data package JP0481 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 75%.

MAJOR DEFICIENCIES

The following major deficiency was noted:

- Due to the holding time being exceeded by greater than twice the limit, all undetected nitrate, nitrite and orthophosphate results were qualified as rejected and flagged "UR".

Rejected data is unusable and should not be reported.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to the holding time being exceeded by greater than twice the limit, all detected nitrate, nitrite and orthophosphate results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*.

DOE/RL-96-22, Rev. 5, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, September 2009.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with WCH validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

WET CHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: JP0481	**REVIEWER: ELR**	**Project: 600-303**	**PAGE 1 OF 1**
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Orthophosphate	J	All	Hold time
Nitrate Nitrite	UR	All	Hold time

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Annotated Laboratory Reports

General Chemistry

Client Sample ID: J1RFN3

Lab Sample ID: 280-39178-2
Client Matrix: Solid

% Moisture: 3.9

Date Sampled: 02/20/2013 1107
Date Received: 02/22/2013 1000

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate Nitrite as N-Soluble	2.5		mg/Kg	0.33	0.81	1.0	353.2
Analysis Batch: 280-161940	Analysis Date: 02/25/2013 1333						DryWt Corrected: Y
Chloride-Soluble	4.9	B	mg/Kg	2.0	5.1	1.0	9056M
Analysis Batch: 280-162031	Analysis Date: 02/25/2013 1641						DryWt Corrected: Y
Nitrate as N-Soluble	0.32	U R	mg/Kg	0.32	2.6	1.0	9056M
Analysis Batch: 280-162032	Analysis Date: 02/25/2013 1641						DryWt Corrected: Y
Bromide-Soluble	0.40	U	mg/Kg	0.40	2.0	1.0	9056M
Analysis Batch: 280-162031	Analysis Date: 02/25/2013 1641						DryWt Corrected: Y
Nitrite as N-Soluble	0.34	U R	mg/Kg	0.34	2.6	1.0	9056M
Analysis Batch: 280-162032	Analysis Date: 02/25/2013 1641						DryWt Corrected: Y
Orthophosphate as P-Soluble	2.4	B N J	mg/Kg	1.3	5.1	1.0	9056M
Analysis Batch: 280-162032	Analysis Date: 02/25/2013 1641						DryWt Corrected: Y
Sulfate-Soluble	4.1	B	mg/Kg	1.8	5.1	1.0	9056M
Analysis Batch: 280-162031	Analysis Date: 02/25/2013 1641						DryWt Corrected: Y
Fluoride-Soluble	1.2	B	mg/Kg	0.84	5.1	1.0	9056M
Analysis Batch: 280-162031	Analysis Date: 02/25/2013 1641						DryWt Corrected: Y

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	3.9		%	0.10	0.10	1.0	D-2216
Analysis Batch: 280-162134	Analysis Date: 02/26/2013 1450						DryWt Corrected: N

4/24/13

General Chemistry

Client Sample ID: **J1RFN4**

Lab Sample ID: 280-39178-3
Client Matrix: Solid

% Moisture: 3.5

Date Sampled: 02/20/2013 1107
Date Received: 02/22/2013 1000

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate Nitrite as N-Soluble	1.7	M N	mg/Kg	0.30	0.76	1.0	353.2
Analysis Batch: 280-161940	Analysis Date: 02/25/2013 1335						DryWt Corrected: Y
Chloride-Soluble	5.4		mg/Kg	2.0	5.1	1.0	9056M
Analysis Batch: 280-162031	Analysis Date: 02/25/2013 1731						DryWt Corrected: Y
Nitrate as N-Soluble	0.32	U R	mg/Kg	0.32	2.6	1.0	9056M
Analysis Batch: 280-162032	Analysis Date: 02/25/2013 1731						DryWt Corrected: Y
Bromide-Soluble	0.40	U	mg/Kg	0.40	2.1	1.0	9056M
Analysis Batch: 280-162031	Analysis Date: 02/25/2013 1731						DryWt Corrected: Y
Nitrite as N-Soluble	0.34	U R	mg/Kg	0.34	2.6	1.0	9056M
Analysis Batch: 280-162032	Analysis Date: 02/25/2013 1731						DryWt Corrected: Y
Orthophosphate as P-Soluble	3.1	B J	mg/Kg	1.3	5.1	1.0	9056M
Analysis Batch: 280-162032	Analysis Date: 02/25/2013 1731						DryWt Corrected: Y
Sulfate-Soluble	3.7	B	mg/Kg	1.8	5.1	1.0	9056M
Analysis Batch: 280-162031	Analysis Date: 02/25/2013 1731						DryWt Corrected: Y
Fluoride-Soluble	1.1	B	mg/Kg	0.84	5.1	1.0	9056M
Analysis Batch: 280-162031	Analysis Date: 02/25/2013 1731						DryWt Corrected: Y

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	3.5		%	0.10	0.10	1.0	D-2216
Analysis Batch: 280-162134	Analysis Date: 02/26/2013 1450						DryWt Corrected: N

4/14/13

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Report Number: 280-39178-1

SDG #: JP0481
SAF#: RC-232

Date SDG Closed: February 22, 2013
Data Deliverable: 7 Day / Summary

CLIENT ID	LAB ID	ANALYSES REQUESTED	ANALYSES PERFORMED
J1RFN2	280-39178-1	6010/7471	6010B/7471A
J1RFN3	280-39178-2	6010/7471/9056M/353.2/8310	6010B/7471A/9056M/353.2/8310
J1RFN4	280-39178-3	6010/7471/9056M/353.2/8310	6010B/7471A/9056M/353.2/8310

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this Case Narrative. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the signature on the Report Cover.

With exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits, with any exceptions noted. Calculations are performed before rounding to avoid round-off errors in calculated results.

This report includes reporting limits (RLs) less than TestAmerica Denver's practical quantitation limits. These reporting limits are being used specifically at the client's request to meet the needs of this project. Please note that data are not normally reported to these levels without qualification, since they are inherently less reliable and potentially less defensible than required by the current NELAC standards.

The results, RLs and MDLs included in this report have been adjusted for dry weight, as appropriate.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 2/22/2013 10:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.9° C.

HPLC - SW846 8310 - PAHs
No anomalies were encountered.

TOTAL METALS - SW846 6010B/7471A
Serial dilution of a digestate in batch 280-161812 indicates that physical and chemical interferences are present for Aluminum. Results have been flagged with an "X".

Low levels of Cadmium are present in the method blank associated with batch 280-161812. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

Silicon was recovered outside the control limits, biased low, in the LCS associated with batch 280-161812, and the associated sample results have been flagged "N". Silicon is a poor performer and has a history of reacting inconsistently. Data are reported as is.

It can be noted that the sample amount was greater than four times the spike amount for Iron in the Matrix Spike performed on sample J1RFN2; therefore, control limits are not applicable.

Aluminum was recovered outside the control limits in the Matrix Spike performed on sample J1RFN2, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

The duplicate analysis of sample J1RFN2 exhibited RPD data outside the control limits for Lead, Manganese, Vanadium, Zinc and Iron, and the associated sample results have been flagged "M". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

Antimony is present at a level greater than the reporting limit in the instrument blank associated with analysis batch 280-162255. As Antimony is not present at a level greater than the reporting limit in the associated samples, corrective action is deemed unnecessary.

No other anomalies were encountered.

GENERAL CHEMISTRY - MCAWW 353.2 - NITRATE NITRITE as N

The Matrix Spike performed on sample J1RFN4 exhibited the percent recovery outside the control limits, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

The duplicate analysis of sample J1RFN4 exceeded the RPD limit, and the associated sample result has been flagged "M". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

GENERAL CHEMISTRY - SW846 9056M - ANIONS

The Orthophosphate as P Matrix Spike performed on sample J1RFN3 exhibited the percent recovery outside the control limits, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-232-008	Page 1 of 1
Collector Brackett, R	Company Contact Joan Kessner	Telephone No. 509-375-4688	Project Coordinator KESSNER, JH	Price Code ~~8C~~ 8B BH 2/20/13
Project Designation 100-IU-2 & 100-IU-6 Remaining Waste Sites - Soil Full Prot	Sampling Location 600-303		SAF No. RC-232	Data Turnaround 7 ~~15~~ Days BH 2/20/13
Ice Chest No. WCH-12-0176 AR 2-21-13	Field Logbook No. EL-1666	COA 0603032000	Method of Shipment Fed Ex	
Shipped To TestAmerica Incorporated, ~~Richland~~ DENVER BH 2/20/13	Offsite Property No. A120766		Bill of Lading/Air Bill No. See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

May contain hazardous substances at levels that present risk to humans and/or the environment.

Special Handling and/or Storage

Maintain preservation as indicated in header.

Preservation	Cool 4C	Cool 4C	Cool 4C								
Type of Container	G/P	G/P	aG								
No. of Container(s)	1	1	1								
Volume	125mL	125mL	125mL								
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	PAHs - 8310								
Sample No.	Matrix *	Sample Date	Sample Time								
J1RFN2	SOIL	2/20/13	1055	X			BH 2/20/13				
J1RFN3	SOIL	2/20/13	1107	X	X	X					
J1RFN4	SOIL	2/20/13	1107	X	X	X					

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By/Removed From RobBrackett RBB Date/Time 1145 2-20-13	Received By/Stored In BHudson BHudson Date/Time 2/20/13 1145	
Relinquished By/Removed From BHudson BHudson Date/Time 2/20/13 1330	Received By/Stored In Birgham Date/Time 1060 2-20-13 1330	
Relinquished By/Removed From WCH 2-21-13 1313 Date/Time 1000	Received By/Stored In Fed Ex Date/Time 2/22/13 Gulf 1000	
Relinquished By/Removed From Date/Time	Received By/Stored In Date/Time	
Relinquished By/Removed From Date/Time	Received By/Stored In Date/Time	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Close-out List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7471 - (CV) {Mercury}

(2) IC Anions - 9056 Modified {Bromide, Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphorous in phosphate, Sulfate}; NO2/NO3 - 353.2 {Nitrogen in Nitrite and Nitrate}; ~~pH (Soil) - 9045 (pH Measurement)~~ BH 2/24/13

JP0481

REVIEWED BY AJ DATE 2-21-13

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 600-303			DATA PACKAGE: JP0481		
VALIDATOR: ELR		LAB: TAL		DATE: 4/14/13	
			SDG: JP0491		

ANALYSES PERFORMED					
Anions/IC	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI	pH	NO_3/NO_2
Sulfate	TDS	TKN	Phosphate		

SAMPLES/MATRIX
J1RFN3 J1RFN4
Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes / No N/A

Comments: _____

_____

_____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? ..... Yes / No N/A

Initial calibrations acceptable? ..... Yes / No N/A

ICV and CCV checks performed on all instruments? ..... Yes / No N/A

ICV and CCV checks acceptable? ..... Yes / No N/A

Standards traceable? ..... Yes / No N/A

Standards expired? ..... Yes / No N/A

Calculation check acceptable? ..... Yes / No N/A

Comments: _____

_____

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) ..... Yes No N/A
ICB and CCB results acceptable? (Levels D, E) ..... Yes No N/A
Laboratory blanks analyzed? ..... Yes No N/A
Laboratory blank results acceptable? ..... Yes No N/A
Field blanks analyzed? (Levels C, D, E) ..... Yes No N/A
Field blank results acceptable? (Levels C, D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: no FB

4. ACCURACY (Levels C, D, and E)

Spike samples analyzed? ..... Yes No N/A
Spike recoveries acceptable? ..... Yes No N/A
Sike standards NIST traceable? (Levels D, E) ..... Yes No N/A
Spike standards expired? (Levels D, E) ..... Yes No N/A
LCS/BSS samples analyzed? ..... Yes No N/A
LCS/BSS results acceptable? ..... Yes No N/A
Standards traceable? (Levels D, E) ..... Yes No N/A
Standards expired? (Levels D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A
Performance audit sample(s) analyzed? ..... Yes No N/A
Performance audit sample results acceptable? ..... Yes No N/A

Comments: no PA

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? ..... (Yes) No N/A
Duplicate results acceptable? ..... (Yes) No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No (N/A)
MS/MSD standards expired? (Levels D, E) ..... Yes No (N/A)
Field duplicate RPD values acceptable? ..... (Yes) No N/A
Field split RPD values acceptable? ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)

Comments: _____

6. HOLDING TIMES (all levels)

Samples properly preserved? ..... (Yes) No N/A
Sample holding times acceptable? ..... Yes (No) N/A

Comments: ortho, nitrate + nitrite — >28 — J/UR

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? ..... Yes No N/A

Results supported in the raw data? (Levels D, E) ..... Yes No N/A

Samples properly prepared? (Levels D, E) ..... Yes No N/A

Detection limits meet RDL? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: _____

Appendix 6

Additional Documentation Requested by Client

Client: Washington Closure Hanford

Job Number: 280-39178-1
Sdg Number: JP0481

Method Blank - Batch: 280-161940

Method: 353.2
Preparation: N/A

Lab Sample ID:	MB 280-161878/1-A	Analysis Batch:	280-161940	Instrument ID:	WC_Alp 2
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\0225NXNK
Dilution:	1.0	Leach Batch:	280-161878	Initial Weight/Volume:	
Analysis Date:	02/25/2013 1330	Units:	mg/Kg	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	02/25/2013 0954				

Analyte	Result	Qual	MDL	RL
Nitrate Nitrite as N-Soluble	0.30	U	0.30	0.75

Method Reporting Limit Check - Batch: 280-161940

Method: 353.2
Preparation: N/A

Lab Sample ID:	MRL 280-161940/18	Analysis Batch:	280-161940	Instrument ID:	WC_Alp 2
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\0225NXNK
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	100 mL
Analysis Date:	02/25/2013 1242	Units:	mg/L	Final Weight/Volume:	100 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate Nitrite as N-Soluble	0.100	0.100	100	50 - 150	

Lab Control Sample - Batch: 280-161940

Method: 353.2
Preparation: N/A

Lab Sample ID:	LCS 280-161878/2-A	Analysis Batch:	280-161940	Instrument ID:	WC_Alp 2
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\0225NXNK
Dilution:	1.0	Leach Batch:	280-161878	Initial Weight/Volume:	
Analysis Date:	02/25/2013 1332	Units:	mg/Kg	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	02/25/2013 0954				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate Nitrite as N-Soluble	49.5	48.97	99	90 - 110	

Client: Washington Closure Hanford

Job Number: 280-39178-1
Sdg Number: JP0481

Matrix Spike - Batch: 280-161940

Method: 353.2
Preparation: N/A

Lab Sample ID:	280-39178-3	Analysis Batch:	280-161940	Instrument ID:	WC_Alp 2
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\0225NXNK
Dilution:	1.0	Leach Batch:	280-161878	Initial Weight/Volume:	
Analysis Date:	02/25/2013 1338	Units:	mg/Kg	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	02/25/2013 0954				

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate Nitrite as N-Soluble	1.7	52.9	42.33	77	90 - 110	N

Duplicate - Batch: 280-161940

Method: 353.2
Preparation: N/A

Lab Sample ID:	280-39178-3	Analysis Batch:	280-161940	Instrument ID:	WC_Alp 2
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\0225NXNK
Dilution:	1.0	Leach Batch:	280-161878	Initial Weight/Volume:	
Analysis Date:	02/25/2013 1336	Units:	mg/Kg	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	02/25/2013 0954				

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Nitrate Nitrite as N-Soluble	1.7	1.43	18	10	M

Client: Washington Closure Hanford

Job Number: 280-39178-1
Sdg Number: JP0481

Method Blank - Batch: 280-162031

Method: 9056M
Preparation: N/A

Lab Sample ID:	MB 280-161901/2-A	Analysis Batch:	280-162031	Instrument ID:	WC_IC3
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	131.TXT
Dilution:	1.0	Leach Batch:	280-161901	Initial Weight/Volume:	
Analysis Date:	02/25/2013 1624	Units:	mg/Kg	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	02/25/2013 1045				

Analyte	Result	Qual	MDL	RL
Chloride-Soluble	2.0	U	2.0	5.0
Bromide-Soluble	0.38	U	0.38	2.0
Sulfate-Soluble	1.7	U	1.7	5.0
Fluoride-Soluble	0.81	U	0.81	5.0

Method Reporting Limit Check - Batch: 280-162031

Method: 9056M
Preparation: N/A

Lab Sample ID:	MRL 280-162031/3	Analysis Batch:	280-162031	Instrument ID:	WC_IC3
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	112.TXT
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	
Analysis Date:	02/25/2013 1048	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Chloride-Soluble	1.00	1.21	121	50 - 150	B
Bromide-Soluble	0.200	0.116	58	50 - 150	B
Sulfate-Soluble	1.00	1.16	116	50 - 150	B
Fluoride-Soluble	0.200	0.229	115	50 - 150	B

Lab Control Sample - Batch: 280-162031

Method: 9056M
Preparation: N/A

Lab Sample ID:	LCS 280-161901/1-A	Analysis Batch:	280-162031	Instrument ID:	WC_IC3
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	130.TXT
Dilution:	1.0	Leach Batch:	280-161901	Initial Weight/Volume:	
Analysis Date:	02/25/2013 1608	Units:	mg/Kg	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	02/25/2013 1045				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Chloride-Soluble	250	233.9	94	90 - 110	
Bromide-Soluble	50.0	48.93	98	90 - 110	
Sulfate-Soluble	250	239.2	96	90 - 110	
Fluoride-Soluble	50.0	48.80	98	90 - 110	

Client: Washington Closure Hanford

Job Number: 280-39178-1
Sdg Number: JP0481

Matrix Spike - Batch: 280-162031

Method: 9056M
Preparation: N/A

Lab Sample ID:	280-39178-2	Analysis Batch:	280-162031	Instrument ID:	WC_IC3
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	134.TXT
Dilution:	1.0	Leach Batch:	280-161901	Initial Weight/Volume:	
Analysis Date:	02/25/2013 1714	Units:	mg/Kg	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	02/25/2013 1045				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Chloride-Soluble	4.9	B	255	255.6	98	80 - 120	
Bromide-Soluble	0.40	U	51.0	51.97	102	80 - 120	
Sulfate-Soluble	4.1	B	255	274.7	106	80 - 120	
Fluoride-Soluble	1.2	B	51.0	48.83	93	80 - 120	

Duplicate - Batch: 280-162031

Method: 9056M
Preparation: N/A

Lab Sample ID:	280-39178-2	Analysis Batch:	280-162031	Instrument ID:	WC_IC3
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	133.TXT
Dilution:	1.0	Leach Batch:	280-161901	Initial Weight/Volume:	
Analysis Date:	02/25/2013 1657	Units:	mg/Kg	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	02/25/2013 1045				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Chloride-Soluble	4.9	B	5.07	4	15	B
Bromide-Soluble	0.40	U	0.40	NC	15	U
Sulfate-Soluble	4.1	B	4.06	0.6	15	B
Fluoride-Soluble	1.2	B	1.26	4	15	B

Client: Washington Closure Hanford

Job Number: 280-39178-1
Sdg Number: JP0481

Method Blank - Batch: 280-162032

Method: 9056M
Preparation: N/A

Lab Sample ID:	MB 280-161901/2-A	Analysis Batch:	280-162032	Instrument ID:	WC_IC3
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	131.TXT
Dilution:	1.0	Leach Batch:	280-161901	Initial Weight/Volume:	
Analysis Date:	02/25/2013 1624	Units:	mg/Kg	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	02/25/2013 1045				

Analyte	Result	Qual	MDL	RL
Nitrate as N-Soluble	0.31	U	0.31	2.5
Nitrite as N-Soluble	0.33	U	0.33	2.5
Orthophosphate as P-Soluble	1.2	U	1.2	5.0

Method Reporting Limit Check - Batch: 280-162032

Method: 9056M
Preparation: N/A

Lab Sample ID:	MRL 280-162032/3	Analysis Batch:	280-162032	Instrument ID:	WC_IC3
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	112.TXT
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	
Analysis Date:	02/25/2013 1048	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate as N-Soluble	0.200	0.243	122	50 - 150	B
Nitrite as N-Soluble	0.200	0.230	115	50 - 150	B
Orthophosphate as P-Soluble	0.200	0.19	87	50 - 150	U

Lab Control Sample - Batch: 280-162032

Method: 9056M
Preparation: N/A

Lab Sample ID:	LCS 280-161901/1-A	Analysis Batch:	280-162032	Instrument ID:	WC_IC3
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	130.TXT
Dilution:	1.0	Leach Batch:	280-161901	Initial Weight/Volume:	
Analysis Date:	02/25/2013 1608	Units:	mg/Kg	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	02/25/2013 1045				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate as N-Soluble	50.0	49.46	99	90 - 110	
Nitrite as N-Soluble	50.0	48.63	97	90 - 110	
Orthophosphate as P-Soluble	50.0	48.44	97	90 - 110	

Client: Washington Closure Hanford

Job Number: 280-39178-1
Sdg Number: JP0481

Matrix Spike - Batch: 280-162032

Method: 9056M
Preparation: N/A

Lab Sample ID:	280-39178-2	Analysis Batch:	280-162032	Instrument ID:	WC_IC3
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	134.TXT
Dilution:	1.0	Leach Batch:	280-161901	Initial Weight/Volume:	
Analysis Date:	02/25/2013 1714	Units:	mg/Kg	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	02/25/2013 1045				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Nitrate as N-Soluble	0.32	U	51.0	54.62	107	80 - 120	
Nitrite as N-Soluble	0.34	U	51.0	51.99	102	80 - 120	
Orthophosphate as P-Soluble	2.4	B	51.0	65.30	123	80 - 120	N

Duplicate - Batch: 280-162032

Method: 9056M
Preparation: N/A

Lab Sample ID:	280-39178-2	Analysis Batch:	280-162032	Instrument ID:	WC_IC3
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	133.TXT
Dilution:	1.0	Leach Batch:	280-161901	Initial Weight/Volume:	
Analysis Date:	02/25/2013 1657	Units:	mg/Kg	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	02/25/2013 1045				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Nitrate as N-Soluble	0.32	U	0.32	NC	15	U
Nitrite as N-Soluble	0.34	U	0.35	NC	15	U
Orthophosphate as P-Soluble	2.4	B	2.15	9	15	B

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Date: 15 April 2013
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-IU-2 & 100-IU-6 Remaining Waste Sites – Soil Full Protocol - Waste Site 600-303
Subject: Inorganics - Data Package No. JP0481-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0481 prepared by TestAmerica Laboratories (TAL). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J1RFN3	2/20/13	Soil	C	See note 1
J1RFN4	2/20/13	Soil	C	See note 1
J1RFN2	2/20/13	Soil	C	See note 1

1 - ICP metals (6010B) and mercury by 7471A.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, September 2009). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY PARAMETERS

Holding Times

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 6 months for ICP metals and 28 days for mercury.

All holding times were acceptable.

- **Preparation (Method) Blanks**

Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "UJ". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the contract required detection limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the instrument detection limit (IDL) and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

Due to method blank contamination, all cadmium results were qualified as undetected and flagged "UJ".

All other preparation blank results were acceptable.

Field (Equipment) Blank

One field blank (J1RFN2) was submitted for analysis. Fourteen analytes were detected in the field blank. Under the WCH statement of work, no qualification is required.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

Due to matrix spike recoveries outside QC limits, all aluminum (403%), manganese (69%) and silicon (20%) results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits (7%), all silicon results were qualified as estimates and flagged "J".

All other accuracy results were acceptable

- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

Due to an RPD outside QC limits, all iron (138%) results were qualified as estimates and flagged "J".

All other laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J1RFN3/J1RFN4) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 Area RQLs to ensure that laboratory detection levels meet the required criteria. All results met the RQL.

- **Completeness**

Data package No. JP0481 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to method blank contamination, all cadmium results were qualified as undetected and flagged "UJ".
- Due to matrix spike recoveries outside QC limits, all aluminum (403%), manganese (69%) and silicon (20%) results were qualified as estimates and flagged "J".
- Due to an LCS recovery outside QC limits (7%), all silicon results were qualified as estimates and flagged "J".
- Due to an RPD outside QC limits, all iron (138%) results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*, March 2008.

DOE/RL-96-22, Rev. 5, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, September 2009.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with WCH validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

INORGANICS DATA QUALIFICATION SUMMARY*

SDG: JP0481	**REVIEWER: ELR**	**Project: 600-303**	**PAGE 1 OF 1**
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Cadmium	UJ	All	Method blank contamination
Aluminum Manganese Silicon	J	All	MS recovery
Silicon	J	All	LCS recovery
Iron	J	All	RPD

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Annotated Laboratory Reports

Client: Washington Closure Hanford

Job Number: 280-39178-1
Sdg Number: JP0481

Client Sample ID: J1RFN2

Lab Sample ID: 280-39178-1
Client Matrix: Solid % Moisture: 0.0

Date Sampled: 02/20/2013 1055
Date Received: 02/22/2013 1000

6010B Metals (ICP)

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 1.0
Analysis Date: 02/26/2013 0106
Prep Date: 02/25/2013 1345

Analysis Batch: 280-162040
Prep Batch: 280-161812

Instrument ID: MT_026
Lab File ID: 26A5022513.asc
Initial Weight/Volume: 1.07 g
Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		198	X N J	1.4	4.7
Arsenic		0.62	U	0.62	0.93
Barium		2.0		0.071	0.47
Beryllium		0.047	B	0.031	0.19
Boron		0.92	U	0.92	1.9
Cadmium		0.039	B C UJ	0.038	0.19
Calcium		33.5	B	13.2	46.7
Chromium		0.084	B	0.054	0.19
Cobalt		0.13	B	0.093	0.93
Copper		0.20	U	0.20	0.93
Lead		0.83	M	0.25	0.47
Magnesium		21.8		3.5	18.7
Manganese		14.6	M J	0.093	0.93
Molybdenum		0.24	U	0.24	1.9
Nickel		0.11	U	0.11	3.7
Potassium		64.9	B	38.3	280
Silver		0.15	U	0.15	0.19
Vanadium		0.53	B M	0.088	1.9
Zinc		1.9	M	0.37	0.93

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 1.0
Analysis Date: 02/26/2013 1938
Prep Date: 02/25/2013 1345

Analysis Batch: 280-162255
Prep Batch: 280-161812

Instrument ID: MT_026
Lab File ID: 26A3022613.asc
Initial Weight/Volume: 1.07 g
Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Antimony		0.36	U	0.36	0.56
Iron		1350	M J	3.6	4.7
Selenium		0.80	U	0.80	0.93
Silicon		89.3	N J	5.3	9.3
Sodium		55.1	U	55.1	112

7471A Mercury (CVAA)

Analysis Method: 7471A
Prep Method: 7471A
Dilution: 1.0
Analysis Date: 02/23/2013 1541
Prep Date: 02/23/2013 1230

Analysis Batch: 280-161906
Prep Batch: 280-161750

Instrument ID: MT_033
Lab File ID: 130223ab.txt
Initial Weight/Volume: .58 g
Final Weight/Volume: 50 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0057	U	0.0057	0.018

Client: Washington Closure Hanford

Job Number: 280-39178-1
Sdg Number: JP0481

Client Sample ID: J1RFN3

Lab Sample ID: 280-39178-2
Client Matrix: Solid % Moisture: 3.9

Date Sampled: 02/20/2013 1107
Date Received: 02/22/2013 1000

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-162040	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-161812	Lab File ID:	26A5022513.asc
Dilution:	1.0			Initial Weight/Volume:	1.00 g
Analysis Date:	02/26/2013 0116			Final Weight/Volume:	100 mL
Prep Date:	02/25/2013 1345				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		7280	X J	1.6	5.2
Arsenic		2.7		0.69	1.0
Barium		67.8		0.079	0.52
Beryllium		0.23		0.034	0.21
Boron		1.7	B	1.0	2.1
Cadmium		0.099	B C UJ	0.043	0.21
Calcium		3480		14.7	52.0
Chromium		10.8		0.060	0.21
Cobalt		6.2		0.10	1.0
Copper		11.8		0.23	1.0
Lead		8.8		0.28	0.52
Magnesium		4270		3.9	20.8
Manganese		286	J	0.10	1.0
Molybdenum		0.36	B	0.27	2.1
Nickel		9.7		0.13	4.2
Potassium		1480		42.7	312
Silver		0.17	U	0.17	0.21
Vanadium		39.6		0.098	2.1
Zinc		47.8		0.41	1.0

Analysis Method:	6010B	Analysis Batch:	280-162255	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-161812	Lab File ID:	26A3022613.asc
Dilution:	1.0			Initial Weight/Volume:	1.00 g
Analysis Date:	02/26/2013 1948			Final Weight/Volume:	100 mL
Prep Date:	02/25/2013 1345				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Antimony		0.49	B	0.40	0.62
Iron		17100	J	4.0	5.2
Selenium		0.89	U	0.89	1.0
Silicon		169	N J	5.9	10.4
Sodium		199		61.4	125

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-161906	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-161750	Lab File ID:	130223ab.txt
Dilution:	1.0			Initial Weight/Volume:	.57 g
Analysis Date:	02/23/2013 1544			Final Weight/Volume:	50 mL
Prep Date:	02/23/2013 1230				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0061	U	0.0061	0.019

Client: Washington Closure Hanford

Job Number: 280-39178-1
Sdg Number: JP0481

Client Sample ID: J1RFN4

Lab Sample ID: 280-39178-3
Client Matrix: Solid

% Moisture: 3.5

Date Sampled: 02/20/2013 1107
Date Received: 02/22/2013 1000

6010B Metals (ICP)

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 1.0
Analysis Date: 02/26/2013 0118
Prep Date: 02/25/2013 1345

Analysis Batch: 280-162040
Prep Batch: 280-161812

4/14/13

Instrument ID: MT_026
Lab File ID: 26A5022513.asc
Initial Weight/Volume: 1.17 g
Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		7080	X J	1.4	4.4
Arsenic		2.3		0.58	0.89
Barium		66.9		0.067	0.44
Beryllium		0.23		0.029	0.18
Boron		1.5	B	0.87	1.8
Cadmium		0.095	B C U J	0.036	0.18
Calcium		3320		12.5	44.3
Chromium		10.6		0.051	0.18
Cobalt		6.2		0.089	0.89
Copper		12.3		0.19	0.89
Lead		16.2		0.24	0.44
Magnesium		4150		3.3	17.7
Manganese		273	J	0.089	0.89
Molybdenum		0.23	U	0.23	1.8
Nickel		9.7		0.11	3.5
Potassium		1460		36.3	266
Silver		0.14	U	0.14	0.18
Vanadium		38.8		0.083	1.8
Zinc		52.8		0.35	0.89

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 1.0
Analysis Date: 02/26/2013 1950
Prep Date: 02/25/2013 1345

Analysis Batch: 280-162255
Prep Batch: 280-161812

Instrument ID: MT_026
Lab File ID: 26A3022613.asc
Initial Weight/Volume: 1.17 g
Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Antimony		0.43	B	0.34	0.53
Iron		16600	J	3.4	4.4
Selenium		0.76	U	0.76	0.89
Silicon		124	N J	5.0	8.9
Sodium		182		52.3	106

7471A Mercury (CVAA)

Analysis Method: 7471A
Prep Method: 7471A
Dilution: 1.0
Analysis Date: 02/23/2013 1555
Prep Date: 02/23/2013 1230

Analysis Batch: 280-161906
Prep Batch: 280-161750

Instrument ID: MT_033
Lab File ID: 130223ab.txt
Initial Weight/Volume: .55 g
Final Weight/Volume: 50 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0063	U	0.0063	0.019

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Report Number: 280-39178-1

SDG #: JP0481
SAF#: RC-232

Date SDG Closed: February 22, 2013
Data Deliverable: 7 Day / Summary

CLIENT ID	LAB ID	ANALYSES REQUESTED	ANALYSES PERFORMED
J1RFN2	280-39178-1	6010/7471	6010B/7471A
J1RFN3	280-39178-2	6010/7471/9056M/353.2/8310	6010B/7471A/9056M/353.2/8310
J1RFN4	280-39178-3	6010/7471/9056M/353.2/8310	6010B/7471A/9056M/353.2/8310

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this Case Narrative. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the signature on the Report Cover.

With exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits, with any exceptions noted. Calculations are performed before rounding to avoid round-off errors in calculated results.

This report includes reporting limits (RLs) less than TestAmerica Denver's practical quantitation limits. These reporting limits are being used specifically at the client's request to meet the needs of this project. Please note that data are not normally reported to these levels without qualification, since they are inherently less reliable and potentially less defensible than required by the current NELAC standards.

The results, RLs and MDLs included in this report have been adjusted for dry weight, as appropriate.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 2/22/2013 10:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.9° C.

HPLC - SW846 8310 - PAHs
No anomalies were encountered.

TOTAL METALS - SW846 6010B/7471A
Serial dilution of a digestate in batch 280-161812 indicates that physical and chemical interferences are present for Aluminum. Results have been flagged with an "X".

Low levels of Cadmium are present in the method blank associated with batch 280-161812. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

Silicon was recovered outside the control limits, biased low, in the LCS associated with batch 280-161812, and the associated sample results have been flagged "N". Silicon is a poor performer and has a history of reacting inconsistently. Data are reported as is.

It can be noted that the sample amount was greater than four times the spike amount for Iron in the Matrix Spike performed on sample J1RFN2; therefore, control limits are not applicable.

Aluminum was recovered outside the control limits in the Matrix Spike performed on sample J1RFN2, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

The duplicate analysis of sample J1RFN2 exhibited RPD data outside the control limits for Lead, Manganese, Vanadium, Zinc and Iron, and the associated sample results have been flagged "M". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

Antimony is present at a level greater than the reporting limit in the instrument blank associated with analysis batch 280-162255. As Antimony is not present at a level greater than the reporting limit in the associated samples, corrective action is deemed unnecessary.

No other anomalies were encountered.

GENERAL CHEMISTRY - MCAWW 353.2 - NITRATE NITRITE as N

The Matrix Spike performed on sample J1RFN4 exhibited the percent recovery outside the control limits, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

The duplicate analysis of sample J1RFN4 exceeded the RPD limit, and the associated sample result has been flagged "M". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

GENERAL CHEMISTRY - SW846 9056M - ANIONS

The Orthophosphate as P Matrix Spike performed on sample J1RFN3 exhibited the percent recovery outside the control limits, and the associated sample result has been flagged "N". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-232-008	Page 1 of 1
Collector Brackett, R	Company Contact Joan Kessner	Telephone No. 509-375-4688	Project Coordinator KESSNER, JH	Price Code ~~8C~~ 8B 2/20/13
Project Designation 100-IU-2 & 100-IU-6 Remaining Waste Sites - Soil Full Prot	Sampling Location 600-303		SAF No. RC-232	Data Turnaround 7 ~~15~~ Days 2/20/13
Ice Chest No. WCH-12-0176 2/20/13	Field Logbook No. EL-1666	COA 0603032000	Method of Shipment Fed EX	
Shipped To 2/20/13 TestAmerica Incorporated, ~~Richland~~ DENVER	Offsite Property No. A1207666		Bill of Lading/Air Bill No. See OSDC	

POSSIBLE SAMPLE HAZARDS/REMARKS

May contain hazardous substances at levels that present risk to humans and/or the environment.

Special Handling and/or Storage

Maintain preservation as indicated in header.

Preservation	Cool 4C	Cool 4C	Cool 4C									
Type of Container	G/P	G/P	aG									
No. of Container(s)	1	1	1									
Volume	125mL	125mL	125mL									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	PAHs - 8310									
Sample No.	Matrix *	Sample Date	Sample Time									
J1RFN2	SOIL	2/20/13	1055	X			BH 2/20/13					
J1RFN3	SOIL	2/20/13	1107	X	X	X						
J1RFN4	SOIL	2/20/13	1107	X	X	X						

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By/Removed From Rob Brackett RBB 2-20-13 Date/Time 1145	Received By/Stored In BHudson BHudson 2/20/13 Date/Time 1145	
Relinquished By/Removed From BHudson BHudson 2/20/13 Date/Time 1330	Received By/Stored In Cindy Burnham 2-20-13 Date/Time 1330	
Relinquished By/Removed From Cindy Burnham WCH 2-21-13 Date/Time 1313	Received By/Stored In Fed Ex Date/Time	
Relinquished By/Removed From Date/Time	Received By/Stored In 2/22/13 Date/Time 1000	
Relinquished By/Removed From Date/Time	Received By/Stored In Date/Time	
Relinquished By/Removed From Date/Time	Received By/Stored In Date/Time	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Close-out List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7471 - (CV) {Mercury}
(2) IC Anions - 9056 Modified {Bromide, Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphorous in phosphate, Sulfate}; NO2/NO3 - 353.2 {Nitrogen in Nitrite and Nitrate}; ~~pH (Soil) - 9045 (pH Measurement)~~ DA 2/22/13

JP0481

REVIEWED BY AS ~~DATE~~ 2-21-13

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 600-303			DATA PACKAGE: JP0491		
VALIDATOR: ELR		LAB: TAL		DATE: 4/19/13	
			SDG: JP0491		
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
JIRFV2 JIRFV3 JIRFV4					
Soil					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes (No) N/A

Comments: _____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? ..... Yes (No) N/A

Initial calibrations acceptable? ..... Yes (No) N/A

ICP interference checks acceptable? ..... Yes (No) N/A

ICV and CCV checks performed on all instruments? ..... Yes (No) N/A

ICV and CCV checks acceptable? ..... Yes (No) N/A

Standards traceable? ..... Yes (No) N/A

Standards expired? ..... Yes (No) N/A

Calculation check acceptable? ..... Yes (No) N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) ..... Yes No N/A
ICB and CCB results acceptable? (Levels D, E) ..... Yes No N/A
Laboratory blanks analyzed? ..... Yes No N/A
Laboratory blank results acceptable? ..... Yes No N/A
Field blanks analyzed? (Levels C, D, E) ..... Yes No N/A
Field blank results acceptable? (Levels C, D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: Cadmium - UJ - all

FB - 14 detects

no FB

4. ACCURACY (Levels C, D, and E)

MS/MSD samples analyzed? ..... Yes No N/A
MS/MSD results acceptable? ..... Yes No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A
MS/MSD standards expired? (Levels D, E) ..... Yes No N/A
LCS/BSS samples analyzed? ..... Yes No N/A
LCS/BSS results acceptable? ..... Yes No N/A
Standards traceable? (Levels D, E) ..... Yes No N/A
Standards expired? (Levels D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A
Performance audit sample(s) analyzed? ..... Yes No N/A
Performance audit sample results acceptable? ..... Yes No N/A

Comments: LCS - Silicon 7% - J all
MS - Manganese (69%) Silica (20%) - J all
al 403% - J all

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable?	Yes	No	N/A
Duplicate results acceptable?	Yes	No	N/A
MS/MSD standards NIST traceable? (Levels D, E)	Yes	No	N/A
MS/MSD standards expired? (Levels D, E)	Yes	No	N/A
Field duplicate RPD values acceptable?	Yes	No	N/A
Field split RPD values acceptable?	Yes	No	N/A
Transcription/calculation errors? (Levels D, E)	Yes	No	N/A

Comments: Iron - 38?. — J all

6. ICP QUALITY CONTROL (Levels D and E)

ICP serial dilution samples analyzed?	Yes	No	N/A
ICP serial dilution %D values acceptable?	Yes	No	N/A
ICP post digestion spike required?	Yes	No	N/A
ICP post digestion spike values acceptable?	Yes	No	N/A
Standards traceable?	Yes	No	N/A
Standards expired?	Yes	No	N/A
Transcription/calculation errors?	Yes	No	N/A

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

7. FURNACE AA QUALITY CONTROL (Levels D and E)

Duplicate injections performed as required?	Yes	No	N/A
Duplicate injection %RSD values acceptable?	Yes	No	N/A
Analytical spikes performed as required?	Yes	No	N/A
Analytical spike recoveries acceptable?	Yes	No	N/A
Standards traceable?	Yes	No	N/A
Standards expired?	Yes	No	N/A
MSA performed as required?	Yes	No	N/A
MSA results acceptable?	Yes	No	N/A
Transcription/calculation errors?	Yes	No	N/A

Comments:_____

8. HOLDING TIMES (all levels)

Samples properly preserved?	Yes	No	N/A
Sample holding times acceptable?	Yes	No	N/A

Comments:_____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? ..... (Yes) No N/A

Results supported in the raw data? (Levels D, E) ..... Yes No (N/A)

Samples properly prepared? (Levels D, E) ..... Yes No (N/A)

Detection limits meet RDL? ..... (Yes) No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes (No) N/A

Comments: _____

_____

_____

_____

_____

_____

_____

Appendix 6

Additional Documentation Requested by Client

Client: Washington Closure Hanford

Job Number: 280-39178-1
Sdg Number: JP0481

Method Blank - Batch: 280-161812

Method: 6010B
Preparation: 3050B

Lab Sample ID:	MB 280-161812/1-A	Analysis Batch:	280-162040	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-161812	Lab File ID:	26A5022513.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1 g
Analysis Date:	02/26/2013 0101	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	02/25/2013 1345				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Aluminum	1.6	U	1.6	5.0
Arsenic	0.66	U	0.66	1.0
Barium	0.076	U	0.076	0.50
Beryllium	0.033	U	0.033	0.20
Boron	0.98	U	0.98	2.0
Cadmium	0.0510	B	0.041	0.20
Calcium	14.1	U	14.1	50.0
Chromium	0.058	U	0.058	0.20
Cobalt	0.10	U	0.10	1.0
Copper	0.22	U	0.22	1.0
Lead	0.27	U	0.27	0.50
Magnesium	3.7	U	3.7	20.0
Manganese	0.10	U	0.10	1.0
Molybdenum	0.26	U	0.26	2.0
Nickel	0.12	U	0.12	4.0
Potassium	41.0	U	41.0	300
Silver	0.16	U	0.16	0.20
Vanadium	0.094	U	0.094	2.0
Zinc	0.40	U	0.40	1.0

Method Blank - Batch: 280-161812

Method: 6010B
Preparation: 3050B

Lab Sample ID:	MB 280-161812/1-A	Analysis Batch:	280-162255	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-161812	Lab File ID:	26A3022613.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1 g
Analysis Date:	02/26/2013 1933	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	02/25/2013 1345				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Antimony	0.38	U	0.38	0.60
Iron	3.8	U	3.8	5.0
Selenium	0.86	U	0.86	1.0
Silicon	5.7	U	5.7	10.0
Sodium	59.0	U	59.0	120

Client: Washington Closure Hanford

Job Number: 280-39178-1
Sdg Number: JP0481

Lab Control Sample - Batch: 280-161812

Method: 6010B
Preparation: 3050B

Lab Sample ID:	LCS 280-161812/2-A	Analysis Batch:	280-162040	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-161812	Lab File ID:	26A5022513.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1 g
Analysis Date:	02/26/2013 0104	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	02/25/2013 1345				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	200	189.5	95	82 - 116	
Arsenic	100	101.8	102	85 - 110	
Barium	200	191.3	96	87 - 112	
Beryllium	5.00	4.88	98	84 - 114	
Boron	100	96.89	97	81 - 110	
Cadmium	10.0	9.70	97	87 - 110	
Calcium	5000	4557	91	82 - 114	
Chromium	20.0	19.71	99	84 - 114	
Cobalt	50.0	47.16	94	87 - 110	
Copper	25.0	25.88	104	88 - 110	
Lead	50.0	47.03	94	86 - 110	
Magnesium	5000	4878	98	90 - 110	
Manganese	50.0	45.99	92	88 - 110	
Molybdenum	100	98.33	98	86 - 110	
Nickel	50.0	45.34	91	87 - 110	
Potassium	5000	4820	96	89 - 110	
Silver	5.00	4.88	98	87 - 114	
Vanadium	50.0	49.27	99	88 - 110	
Zinc	50.0	44.95	90	76 - 114	

Lab Control Sample - Batch: 280-161812

Method: 6010B
Preparation: 3050B

Lab Sample ID:	LCS 280-161812/2-A	Analysis Batch:	280-162255	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-161812	Lab File ID:	26A3022613.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1 g
Analysis Date:	02/26/2013 1936	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	02/25/2013 1345				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Antimony	50.0	51.49	103	82 - 110	
Iron	100	96.97	97	87 - 120	
Selenium	200	196.0	98	83 - 110	
Silicon	1000	73.46	7	10 - 70	N
Sodium	5000	5501	110	90 - 112	

Client: Washington Closure Hanford

Job Number: 280-39178-1
Sdg Number: JP0481

Matrix Spike - Batch: 280-161812

Method: 6010B
Preparation: 3050B

Lab Sample ID:	280-39178-1	Analysis Batch:	280-162040	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-161812	Lab File ID:	28A5022513.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1.10 g
Analysis Date:	02/26/2013 0113	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	02/25/2013 1345				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	198		182	930.5	403	50 - 200	N
Arsenic	0.62	U	90.9	89.08	98	76 - 111	
Barium	2.0		182	168.0	91	52 - 159	
Beryllium	0.047	B	4.55	4.22	92	72 - 105	
Boron	0.92	U	90.9	85.34	94	75 - 107	
Cadmium	0.039	B	9.09	8.41	92	40 - 130	
Calcium	33.5	B	4550	3963	86	43 - 165	
Chromium	0.084	B	18.2	17.28	95	70 - 200	
Cobalt	0.13	B	45.5	41.15	90	72 - 106	
Copper	0.20	U	22.7	23.13	102	37 - 187	
Lead	0.83		45.5	41.65	90	70 - 200	
Magnesium	21.8		4550	4373	96	64 - 145	
Manganese	14.6		45.5	45.72	69	40 - 200	
Molybdenum	0.24	U	90.9	85.56	94	75 - 103	
Nickel	0.11	U	45.5	39.55	87	61 - 126	
Potassium	64.9	B	4550	4235	92	56 - 172	
Silver	0.15	U	4.55	4.31	95	75 - 141	
Vanadium	0.53	B	45.5	44.03	96	50 - 169	
Zinc	1.9		45.5	41.31	87	70 - 200	

Matrix Spike - Batch: 280-161812

Method: 6010B
Preparation: 3050B

Lab Sample ID:	280-39178-1	Analysis Batch:	280-162255	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-161812	Lab File ID:	26A3022613.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1.10 g
Analysis Date:	02/26/2013 1946	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	02/25/2013 1345				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Antimony	0.36	U	45.5	43.22	95	20 - 200	
Iron	1350		90.9	398.3	-1042	70 - 200	4
Selenium	0.80	U	182	168.1	92	76 - 104	
Silicon	89.3		909	267.1	20	20 - 200	
Sodium	55.1	U	4550	4703	103	78 - 111	

Client: Washington Closure Hanford

Job Number: 280-39178-1
Sdg Number: JP0481

Duplicate - Batch: 280-161812

Method: 6010B
Preparation: 3050B

Lab Sample ID:	280-39178-1	Analysis Batch:	280-162040	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-161812	Lab File ID:	26A5022513.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1.08 g
Analysis Date:	02/26/2013 0111	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	02/25/2013 1345				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Aluminum	198		177.4	11	40	
Arsenic	0.62	U	0.61	NC	30	U
Barium	2.0		1.74	16	30	
Beryllium	0.047	B	0.031	NC	30	U
Boron	0.92	U	0.91	NC	30	U
Cadmium	0.039	B	0.0380	3	30	B
Calcium	33.5	B	29.79	12	30	B
Chromium	0.084	B	0.0731	14	40	B
Cobalt	0.13	B	0.093	NC	30	U
Copper	0.20	U	0.20	NC	30	U
Lead	0.83		0.425	65	40	B M
Magnesium	21.8		19.61	11	30	
Manganese	14.6		4.81	101	40	M
Molybdenum	0.24	U	0.24	NC	30	U
Nickel	0.11	U	0.11	NC	30	U
Potassium	64.9	B	61.82	5	40	B
Silver	0.15	U	0.15	NC	30	U
Vanadium	0.53	B	0.218	83	30	B M
Zinc	1.9		1.20	44	40	M

Duplicate - Batch: 280-161812

Method: 6010B
Preparation: 3050B

Lab Sample ID:	280-39178-1	Analysis Batch:	280-162255	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-161812	Lab File ID:	26A3022613.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1.08 g
Analysis Date:	02/26/2013 1943	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	02/25/2013 1345				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Antimony	0.36	U	0.35	NC	40	U
Iron	1350		248.8	138	40	M
Selenium	0.80	U	0.80	NC	30	U
Silicon	89.3		86.82	3	40	N
Sodium	55.1	U	54.6	NC	30	U

Client: Washington Closure Hanford

Job Number: 280-39178-1
Sdg Number: JP0481

Method Blank - Batch: 280-161750

Method: 7471A
Preparation: 7471A

Lab Sample ID:	MB 280-161750/1-A	Analysis Batch:	280-161906	Instrument ID:	MT_033
Client Matrix:	Solid	Prep Batch:	280-161750	Lab File ID:	130223ab.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	.6 g
Analysis Date:	02/23/2013 1537	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	02/23/2013 1230				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Mercury	0.0055	U	0.0055	0.017

Lab Control Sample - Batch: 280-161750

Method: 7471A
Preparation: 7471A

Lab Sample ID:	LCS 280-161750/2-A	Analysis Batch:	280-161906	Instrument ID:	MT_033
Client Matrix:	Solid	Prep Batch:	280-161750	Lab File ID:	130223ab.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	.6 g
Analysis Date:	02/23/2013 1539	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	02/23/2013 1230				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.417	0.398	95	87 - 111	

Matrix Spike - Batch: 280-161750

Method: 7471A
Preparation: 7471A

Lab Sample ID:	280-39178-2	Analysis Batch:	280-161906	Instrument ID:	MT_033
Client Matrix:	Solid	Prep Batch:	280-161750	Lab File ID:	130223ab.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	.54 g
Analysis Date:	02/23/2013 1553	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	02/23/2013 1230				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.0061	U	0.482	0.466	97	87 - 111	

Client: Washington Closure Hanford

Job Number: 280-39178-1
Sdg Number: JP0481

Duplicate - Batch: 280-161750

Method: 7471A
Preparation: 7471A

Lab Sample ID:	280-39178-2	Analysis Batch:	280-161906	Instrument ID:	MT_033
Client Matrix:	Solid	Prep Batch:	280-161750	Lab File ID:	130223ab.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	.57 g
Analysis Date:	02/23/2013 1551	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	02/23/2013 1230				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Mercury	0.0061	U	0.0061	NC	20	U